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Experimental study on the onset of cavitation induced by an impact[1] AKIHITO KIYAMA, CHIHIRO KURIHARA, YOSHIYUKI TAGAWA, Tokyo Univ of Agri & Tech — We study reasonable expression for predicting the onset of cavitation induced by an impact experimentally. A liquid-filled test tube is dropped and impacts a floor, followed by the emergence of cavitation bubbles inside a liquid. As floor materials, a metal and a resin are chosen. As a wetting liquid, gas-saturated silicone oil was used. Experiments are conducted at room temperature. The condition for cavitation occurrence for a resin floor cannot be described by the typical velocity measured by high-speed imaging, temporal resolution and spatial resolution of which are respectively O(10) μs and O(100) μm. We investigate sudden acceleration at the impact using an accelerometer. Its temporal resolution is O(1) ns, much smaller than that of high-speed imaging. The time history of acceleration for the resin floor is more moderate and peak acceleration is smaller than that for the metal floor. Based on these findings, we discuss the reasonable description of the criterion for the onset of cavitation bubbles, applicable for various floors.

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